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ABSTRACT

This research review on basic reading skills begins with an historical perspective on reading methods, followed by an overview of reading instruction methods for the general population. Research findings are presented on several instructional methods, including phonetic, linguistic, artificial orthography, basal reading, and language experience methods. Findings from the Cooperative Research Program, consisting of 27 coordinated studies of beginning reading, are also reported. The literature review then focuses on teaching learning-disabled children to read, describing several studies which compare instructional methods such as phonics versus other methods, phonics versus phonics (experimental materials), and the language experience approach versus other methods. The relative effectiveness of multisensory techniques is then analyzed, with discussions of theoretical foundations for use of visual auditory kinesthetic tactile (VAKT) techniques, challenges to these theories, and research results of VAKT's impact on word recognition and visual discrimination. In order to give a representative picture of the state of research, two reading method studies which lack control groups are described. Finally, investigations regarding the efficacy of various types of supplemental instruction for the learning-disabled child are reviewed, divided according to type of service provided: resource room programs; tutoring; and remedial reading clinics. (JDD)

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BASIC READING SKILLS

N. Dale Bryant, Phoebe Peister

Susan Fadiman, Harriet Fayne, Knowlton Pierce

Research Review Series 1979
Volume 2

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READING METHODS: A HISTORICAL PERSPECTIVE

In analyzing the numerous research studies and scholarly discussion on reading, one soon becomes aware of the intense controversy that has surrounded any attempt to select one method or approach as being superior to another. Axline (1957) stated that the cycle of extremes associated with the selection of one specific reading method probably contributed to most of the confusion on how basic reading should be taught. This view was also expressed earlier by Gray (1948). Detailed and quite interesting historical accounts of this issue may be found in Huey (1908), Fries (1962), and Smith (1965).

According to Smith (1963, 1965), the prevailing method of teaching reading from 1900-1920 was that of systematic phonics. The word or look-say method was in widespread use from 1920-1935. Intrinsic or analytic phonics combined with the whole word method was the main approach to instruction from 1935-1955. This approach formed the foundation of the basal reading programs published during these years. Barton and Wilder (1964) and Chall (1967) found that the basal reading programs reflecting this approach did not change during this period.

From 1955-1965, this approach was still the prevailing method for beginning reading instruction. However, there was a definite movement both in society and in the field of reading to question this approach. The writings of Flesch (1955), Daniels and Diack (1966), Terman and Walcutt (1958), and Walcutt (1961) had a great influence on stimulating a great deal of discussion and debate on the issue of how reading should be taught in the schools.

It is interesting to note, at this point, that in reality this issue was under consideration since 1912. From 1912-1940 several studies were conducted comparing the word approach with a phonics approach. Valentine (1913), Currier and Duguid (1916), Winch (1925), Sexton and Herron (1928), Mosher and Newell (1930), Tate (1937), Gates and Russell (1938), and Tate (1940) all reported

that the word method was superior to a method of using merely systematic or intrinsic phonics. These studies found that comprehension was usually better with the whole word approach. Chall (1967) feels that the interpretation of the results from these studies was probably influential in causing publishers to delay phonics instruction until the second grade. From an analysis of these studies one can see how this would be a very questionable interpretation, since the concept of delayed phonics was not tested in any of the experiments.

The period from around 1930-1965 was concerned with the question of whether phonics should be taught by the systematic or intrinsic method. Agnew (1935, 1939), Sparks (1956), Sparks and Fay (1957), Bloomer (1961), Gates (1961) and Tensuan and Davis (1963, 1964) reported experimental findings that suggested no difference in the two methods of instruction. Bear (1959, 1964) reported results that were not statistically significant. Peyton and Porter (1926) and McDowell (1953) reported that the intrinsic method was superior for children in grades one and four. Russell (1943), Wohleber (1953), Henderson (1955), Linehan (1958), Kelley (1958), Daniels and Diack (1960), Wollam (1961) and Duncan (1964) found that a program of systematic phonics was superior to that of the intrinsic method. Santeusiano (1962) and Gold (1964) studied the effect of additional phonics beyond that provided for in the basal reader program. Both reported that the children who received additional phonics achieved better results as far as making fewer substitution errors when reading.

Although each of the studies reported from 1912 to 1955 achieved some results within their respective populations, it is almost impossible to generalize any of the findings onto the entire population of beginning readers. In almost every study, the experimental design was so faulty that the conclusions reached by the researchers did not logically follow from their reported procedures and findings. This situation improved as the researchers began to spend more time concerning themselves with measurement and evaluation. The studies of Gates

and his colleagues (Gates, 1927; Gates and Russell, 1938) are examples of this point. These studies were grounded in theory, used better instruments for evaluation, and were more analytical in presenting their results. Many of the later studies reflect the trend to make better use of standardized testing instruments.

Despite the fact that these studies were not able to fully substantiate any position on the teaching of reading, they did help to formulate some of the most popular notions regarding reading instruction. From a review of the various historical accounts of reading instruction, it appears as if these notions gradually evolved into principles of sound teaching. Matthews (1976) feels that these principles gradually formed the rationale for most published programs from about 1930 on. Although minority views during this period, as in the past, were expressed and followed in practice, most teacher education textbooks and basal reading guides agreed on the following principles:

1. The process of reading should be defined broadly to include as major goals, not only word recognition, but also comprehension and interpretation, appreciation, and application of what is read to the study of personal and social problems.

2. The child was expected to begin reading with the meaningful words, sentences, and stories most closely geared to his own experiences and interests.

3. Silent reading was encouraged from the beginning.

4. The child was expected to develop a sight vocabulary of about fifty words before beginning the study of phonics.

5. Phonics instruction was based on the analysis of known whole words, in an attempt to enable the child to see the relationship between the sounds in spoken words and the letters representing them.

6. The child was encouraged to utilize picture and meaning clues to decode new words along with a use of phonics.

7. Structural analysis was expected to begin at the same time as phonics.

8. Word analysis skills was the heading usually used to include all of the methods for decoding unknown words.

9. Numerous programs encouraged the child to only use phonics when all of the other methods failed.

10. It was suggested that phonics instruction be developed gradually over the entire six years of the program in basic reading.

11. The basic method prescribed that drill or practice in phonics in isolation was to be avoided. It also required that the phonics be integrated with meaningful connected reading. In addition, the child was not supposed to isolate sounds and blend them to form words. Unknown words were to be identified through the process of visual analysis and substitution.

12. It was thought that the words in the pupils' readers should be repeated often. Most researchers felt that the words should be carefully controlled of a meaning frequency principle; i.e., they should be words that appear most frequently in general reading matter and are within the child's listening and speaking vocabulary.

13. The child was expected to have a slow and easy start in the first grade. It was recommended that all children pass through a preparatory period, and those judged not ready for formal reading instruction should have a longer one.

14. Grouping on the basis of achievement was encouraged for all classrooms. Three appeared to be the usual preference.

From about 1930 to 1965, these principles were incorporated into the most widely used basal readers and teaching guides. Researchers have found that they have also formed the basis for most of the methods courses in the teaching of reading, and have been followed by most classroom teachers (Barton and Wilder, 1964).

The period from 1965 to the present has been marked by many changes in the field of reading instruction. Chall (1967) felt that many of these changes were brought about as a result of attempts to challenge the basic principles of reading instruction mentioned above. The first change involved the advent of many new and varied programs and materials for the teaching of reading. These have included partial phonics programs, supplementary word learning materials, complete reading programs based on synthetic phonics, linguistic programs, initial teaching alphabet, individualized reading, the language experience approach, and programmed learning. Aukermann (1971) described many of these in his book on beginning approaches to reading. The second change involved the innovations in the basal reading programs. Indeed, several of the more widely used programs

have been revised several times during the past ten years. All of these changes tend to be geared toward the ultimate goal of providing more individualization of instruction in reading. The third major change has been an increased interest in pursuing experimental research.

READING INSTRUCTIONAL METHODS FOR THE GENERAL POPULATION

Overview

Although a large amount of research has been done over the past twenty years in the field of reading, with much of it dealing with approaches to instruction, most of the studies have been piecemeal. Generally, investigators were working from differing orientations using varied measurement techniques, norms and criteria. This lack of consistency and integration makes it hard to draw general conclusions. This problem has been discussed at great length by Chall (1967), Barton and Wilder (1963, 1964) and Dallmann (1974).

In an effort to coordinate research, the U.S. Office of Education sponsored the Cooperative Research Program in First-Grade Reading Instruction during 1964-65. Several studies were eventually carried on for two to three years. Results of these projects will be included.

Despite limited findings, reading research has contributed to the evolution of current methods of reading instruction. Many experts refer to this method as the "eclectic" approach. Teacher education textbooks assume that sight words and phonics as well as other component skills, should be taught to normal learners (Dechant, 1970; Heilman, 1970; Dallmann, 1978; Durkin, 1978). Since no one method has proven to be effective above all others, the eclectic approach has been adopted by publishers and teachers. However, these findings are subject to the interpretation that teacher variables and the learning efficiency of the majority of children are the factors that are making the methods look comparable.

TERMS AND DEFINITIONS

For purposes of unity and clarity, it is necessary to define the following terms: 1) instructional reading method; 2) reading materials; and 3) approaches to word recognition.

Instructional Reading Method

Instructional reading method refers to how the child is essentially taught to decode. Reading methods include: (a) the basal method, (b) the phonetic method, (c) the linguistic method, (d) the artificial orthography method, (e) the language experience method, and (f) the individual method.

In defining each instructional reading method, it is essential to realize that there is no one "pure" method. Not only do the definitions of the methods vary within the field of reading, but considerable variation exists in determining which reading materials are considered what method. For example, while Bliesmer and Yarborough (1965) classify the instructional materials Programmed Reading as synthetic-phonetic, Aukerman (1971) classified these materials as linguistic, Cronbach and Snow (1969) describe them as programmed instruction, and Sabatino and Dorfman (1974) describe them as a visual method-treatment.

The basal method, the basal approach, the traditional basal, and/or the basal series have been defined in several ways. Traditionally, basal meant the reading series used in an instruction program. In that context there was no regard to actual techniques involved, whether phonetic decoding, linguistic decoding, etc. Bond (1948), for example, defines basal as "skill--the developing part, which in practice, includes all the activities and procedures which help a child learn to read" (p. 15). Aukerman (1971), on the other hand, avoids the term "basal" and refers to the basal method as "approaches to beginning reading" (p. 1). Cronbach and Snow (1974) define the basal method as the whole-word approach to reading, and in the 1930s it was called the "look-say"--whole-word method (p. 9A-3).

For the present research the term "basal method" essentially uses the characteristics described by Bond and Dykstra (1967). These include the following: 1) vocabulary is introduced slowly and repeated often; 2) vocabulary control is based on frequency of usage rather than on regularity of sound-symbol relationships; 3) word attack skill-word analysis is introduced gradually and usually only after some "sight" words have been taught; 4) from the beginning, the child is encouraged to use other word recognition skills such as context, structural analysis, and picture clues; 5) emphasis from the beginning is placed on comprehension and interpretation of what is read along with the teaching of a "sight" vocabulary; 6) silent reading is emphasized early in the program; 7) skills are introduced and developed systematically; and 8) a "well-known" Basic Reading Series is used as the major instructional tool.

The phonetic instructional method has been referred to as phonics, phonemic approaches, synthetic phonics, etc. Basically, the terms all refer to a method of reading which emphasizes the teaching of individual letters of the alaphabet that are matched with the specific sounds of English pronunciation. This skill is followed by a synthesizing or blending of the sounds into whole words (Durkin, 1968).

The phonetic method has been further classified as synthetic or analytic (Bliesmer and Yarborough, 1965). The synthetic method requires the child to first learn the letter-sound relationship (word elements) and then learn how to synthesize these word elements into whole words. The analytic method requires the child to first learn whole words and then through various "analytic techniques," such as using the context, he eventually recognizes letters and the sounds they represent.

Closer examination of the analytic phonetic method reveals a striking resemblance to the basal method, to a point where the two methods appear interchangeable. For the purpose of the present research, therefore, the

analytic-phonetic method in reading will be considered synonymous with the basal instructional method even though differentiation of the two methods exists in the literature (Bond & Dykstra, 1967; Baer, 1959). The synthetic-phonetic method will be referred to as the phonetic instructional method.

Generally, the phonetic method includes the following characteristics (Hirn, Harrow, Peister & Seidenburg, 1973): 1) word attack skill is emphasized from the beginning; 2) decoding is letter by letter. Almost exclusive attention is initially directed toward learning the sounds of vowels and consonants; 3) blending sounds and applying rules learned in decoding, in order to form whole words. This is a deductive method (Aukerman, 1971); 4) minimal training in visual and auditory discrimination; 5) minimal number of reinforcements of word attack skills; and 6) minimal or poorly defined correction procedure in teachers' manual.

The third instructional reading method, defined as linguistic, generally has the following characteristics (Hirn, Harrow, Peister & Seidenburg, 1973): 1) early stress is placed on decoding; 2) letter names are taught; 3) knowledge of letter names and the ability to recognize letters are a prerequisite skill for reading instruction; 4) sound-spelling patterns (word families) are taught sequentially; 5) words with high sound-symbol regularity are taught first. The child, without rules or generalization, is led to discover the sound-symbol relationships. The procedure is an inductive one (Aukerman, 1971); and 6) exceptional or irregular words are taught independently as word units.

The fourth method, artificial orthography, basically is a one-to-one symbol method of teaching reading. One symbol has been devised to represent one and only one sound of our language. This method attempts to simplify the task of decoding by introducing a new 40-45 character alphabet with which to encode the approximately 40-45 sounds in the English language (Fry, 1964). Having one symbol to represent one sound supposedly facilitates consistency in word analysis

and word attack skills. According to Mazurkiewicz (1967) and Downing (1964), transition from the use of an artificial orthography method to the use of a traditional orthography is relatively simple.

The instructional materials usually associated with the artificial orthography method are ITA (Initial Teaching Alphabet). There are two commonly used ITA series; one is from England, published by the Initial Teaching Publishing Company and the other is published in the United States by i/t/a Publications (Downing, 1963; Tanyzer and Mazurkiewicz, 1964).

Number five, the language experience instructional reading method, attempts to bring communication or language arts skills, reading, writing, listening, and speaking, together as a unit. Allen (1964), one of the creators of the language experience method, states:

> The "togetherness" of skill development makes possible the continuing use of each child's own experience background and thinking as he grows toward reading maturity (p. 60).

The basic element of this reading method is that the child's own writing serves as a medium of instruction. Thus, integrating the child's language arts with his experience is supposed to create ongoing and purposeful learning (Staffer, 1970).

The next method, known as the "individualized method," is not a single method as such but, rather, an approach that uses a variety of strategies and methods. It is usually implemented on a one-to-one basis, although some group procedures are used on occasion. The approach attempts to utilize the interests of children and permits the student to select his own reading material. Such an approach could allow a child to decode based on his individual learning style. Thus, a teacher using the individualized method, could have a child decoding linguistically or phonetically using material of high interest to the child.

Reading Materials

For all of the instructional reading methods heretofore described, there is

an abundance of reading materials and programs. If, for example, a teacher were to prescribe the linguistic approach for a reading group, his next step would involve the selection of materials appropriate to this method. There are several different readers designed for the linguistic method, such as SRA--Basic Reading Series, Bloomfield Barnhart--Let's Read, and the Merrill Linguistic Readers.

Approaches to Word Recognition

The concept of approach to the teaching of reading or word recognition refers to the modality the teacher uses to present the lesson. The techniques include kinesthetic, visual, auditory, or a combination of the three (Mills, 1964). Usually, any of these techniques can be applied to an instructional method.

SPECIFIC STUDIES

Research findings have been divided by instructional method. Those which will be discussed are: phonetic, linguistic, artificial orthography, basal reading and the language experience methods. Because the Cooperative Research project is a landmark in the field of reading, its findings are reported in a separate section.

Phonetic Studies

Sparks and Fay (1957) compared a basal method (basic reading program) to a phonetic method. Instructional materials for the basal method were not given. Instructional materials for the phonetic method were Phonetic Keys to Reading (1952). The test used was the California Reading Test. At the end of grade one, children using the phonetic method were superior in reading comprehension to the children using the basal method. The results were maintained in grade two. At the end of grade three, pupils in the slow-learning basal group achieved "slightly higher" in comprehension than the phonetic group. At the end of grade four, using the Gates Reading Survey, there was no evidence that either method favored the slow learner, the middle group, or the fast learner.

Kelley (1958) also compared the basal method to a phonetic method. The

materials used for the basal method were Scotts Foresman, no date given. Instructional materials for the phonetic method were Phonetic Keys to Reading (1952). She predicted that there would be no difference in reading achievement at the end of grade two, as measured by the California Achievement Test. However, there was a statistically significant difference between the achievement score of the two groups favoring the phonetic group.

Morgan and Light (1963), questioning the results of the Sparks and Fay study, conducted their own research. The materials used for the basal method were not given. The materials used for the phonetic method were Phonetic Keys to Reading (1952). The study was designed to determine which method, the basal or phonetic, would produce significantly superior reading achievement results by the end of the third grade. The test used was the California Achievement Test. The results indicated that there was no significant difference between the two methods used.

Bear (1952), in a longitudinal study, compared the basal method (analytic method) to the phonetic method. Children were grouped by ability based on the results of the California Test of Mental Maturity. The achievement test used was the Gates Primary Reading Test. By the end of the first grade, the results indicated that the phonetic method "achieved much higher scores" than the basal method. Starting in grade two and continuing through grade six, all children used the basal method. Bear (1964) tested the children at the end of grade six to measure the long-range effects of an intense phonetic program used in first grade. The test he used was the Gates Reading Survey to measure the results. The results indicated differential interaction by ability grouping. Children in the bottom third group of intelligence did better using the phonetic method, but it was not, however, a measured significant difference. The middle group favored the phonetic method and, in this case, there was a measured significant difference. The top group results showed no difference between methods. The group that seemed to benefit most from the phonetic method was the children in

the middle intelligence category.

Bloomer (1960), in a limited study, investigated the difference in achievement results between using a basal method and phonetic method in the first grade. The post-test used was the Gates Primary Reading Test. The results statistically indicated superior reading performance for the group using the phonetic method. It should be noted, however, that the instructional materials used for the phonetic method were special investigator-made materials. The words taught were limited to those that could be worked out phonetically.

Morrone (1959) did his doctoral study on the use of phonics in teaching beginning reading. He reviewed 198 references and found that only thirty-three of these studies were valid. Secondly, he found considerable confusion and contradiction in the use of the terms, definitions, and "other" variables. Finally, he noted:

> Disagreement exists as to the approach and amount of phonic instruction teachers should utilize in reading; however, most of the scientifically accurate experiments show that phonics has considerable value to the learner in the reading process (p. 2030).

Gates (1961) did a study to evaluate the relative effectiveness of the phonetic method using the Mac Carden instructional materials. He compared the average reading grade to the mental grade. These were computed at the end of grades three, four, and five. In all three grades the results indicated that the children read "slightly less than do children of the same age and intelligence in the average American public school." In other words, the Accomplishment Quotient fell below expected levels. In spite of these results, Gates still considers the phonetic method valuable but recommends the development of new instructional materials to replace Mac Carden's.

McCollum (1962), also using the Mac Carden instructional materials, did a study comparing them to the basal method. Using the California Reading Achievement Test, the students showed no significant difference in scores when tested

at the end of first grade and, likewise, at the end of third grade.

Allen (1962) did a study involving three approaches to reading. The methods used were the basal (basic reading approach), the individual, and the language experience. Instead of comparing the methods, one against the other, his hypothesis was that there are numerous effective ways of teaching reading in our schools. Based upon observation, reports, and systematic analysis of the data, his research team confirmed this hypothesis. How each method is most effectively implemented, and with which population, were not discussed.

Sabaroff (1963) compared the effectiveness of two different approaches in the teaching of phonetics to second graders. Group one used the basal method plus a systematic phonics supplement. Group two used the basal method plus a functional supplement (an approach which gives students phonic elements only as he needs them). Group three used only the basal method and no supplement. All three groups used the same basal instructional materials. When groups one and two were doing their supplemental reading work, group three was given free reading time. If a student in this group came across an unfamiliar word, the whole word was given to the student. The Gates Advanced Primary Reading Test was administered at the end of three months. The results suggested that the basal method supplemented with the systematic phonics may be superior for low achievers. The basal method supplemented with the functional phonics seems best for the average and high achievers. The basal method without any supplement produced the lowest results and was not superior for any ability group. Bliesmar and Yarborough (1965) compared the basal method (analytic method) to the phonetic method (synthetic method). They used the instructional materials from five different basal series and compared them to the instructional materials from five different phonetic series. That is, of the ten reading groups considered phonetic, each group used only one set of instructional materials. The same held true for the groups using the basal method. At the end of the first grade, the

Stanford Achievement Test was administered. The result statistically indicated that the phonetic method tended to be more productive in terms of reading achievement than the basal method.

Linguistic Studies

Sister Mary Edward Dolan compared a linguistic (modified linguistic) method to a basal method (composite basal) (Dolan, 1964). While both groups used the same basal readers, there was a different emphasis placed on particular skill development. For example, in the linguistic group the emphasis was on word attack. The group was supplemented with specially prepared linguistic materials using Bloomfield's plan. In the basal group, emphasis was placed on meaning and comprehension. No special supplementary materials were used, but the reading time was the same as the group using the linguistic method. Children were placed in ability groups based on the results of the Lorge-Thorndike. The achievement test used was the Gates Reading Survey. The results indicated that at the end of the fourth grade, children using the linguistic method did better in reading achievement. In a treatment by levels, the children in the low and average ability group benefited more from the linguistic method than the children from the high ability group.

In a study similar to Sister Dolan's, Davis (1964) also compared the linguistic method to the basal method. Both groups used the same basal readers. The group using the linguistic method was supplemented with specially prepared materials using Bloomfield's plan. The students were tested with the Metropolitan Achievement Test given at the end of the first grade. The tests showed significant differences in reading achievement in favor of the children using the linguistic method.

Sister Mary Fidelia (1959) also did a study using the linguistic method. She, however, compared the linguistic method to a phonetic method. The tests, given in grade one, were the Metropolitan Achievement Test and the Stanford

Achievement Test. At the end of twenty weeks of instruction, there were no significant differences between the linguistic method and the phonetic method.

Artificial Orthography Studies

A study comparing artificial orthography with the basal method was prepared by Sebesta (1964). At the end of first grade, he tested the children using the Gates Primary Reading Test and found no significant differences between the two methods. (In an informal oral reading test of unfamiliar words, the boys seem to have benefited more from the artificial orthography.) The materials used in the basal method are not given.

Downing (1963) also compared artificial orthography with the basal method but with different results. His study was conducted in the British schools using the Neale Analysis of Reading Ability Test. After two years the group using the artificial orthography achieved significantly higher scores for accuracy in reading comprehension than the basal group. The materials used for the basal method are not given. The materials used for the artificial orthography method were Initial Teaching Alphabet (1963).

Cooperative Research Study

In the mid-1960s a Cooperative Research Program was conducted consisting of twenty-seven coordinated studies of beginning reading (Bond & Dykstra, 1967). The studies, sponsored by the United States Office of Education, were designed to obtain information relevant to the basic reading-learning process for children in the first grade. Some of the projects extended their first grade investigations into the second grade. The results of any post-tests administered at the end of second grade will be reported.

While the investigators used different instructional methods and different instructional materials, they all sought to obtain this information by answering two questions basic to the reading process:

1) Which of the many approaches to initial reading instruction produces superior reading achievement at the end of first grade?

2) Is any program uniquely effective or ineffective for pupils with high or low readiness for reading?

Each project of the Cooperative Research Program ran for approximately 140 school days and all used the same pre- and post-tests. The pre-test measures were the Murphy-Durrell Phonemes Test, the Murphy-Durrell Letter Names Test, and the Pintner-Cunningham Primary Intelligence Test. The post-test measure was the Stanford Achievement Test. When "reading achievement" is reported by the investigator, it refers specifically to the scores achieved on the Paragraph Meaning section of the Stanford Test.

Although common experimental guidelines were given to each project, the International Reading Association cautions against making any between-project comparisons because of the number of variables that were not uniformly controlled in all studies (Stauffer, 1966). For example, among the projects there were instructional methods similarly labeled which were similar in name only--not in practice. Furthermore, as observed by Chall and Feldman, within any single project there was often a difference between the instructional method described and the instructional procedure actually implemented in the classroom (Chall & Feldman, 1966). In addition, different statistical procedures were used in each project. Consequently, the present research is compelled to review the applicable studies in a project-by-project manner.

Hahn (1966) compared three methods of teaching reading: the artificial orthography method (ITA), the language experience method (language arts), and the basal method (basic readers). There were no significant differences between the language experience method and artificial orthography method. However, both of these methods provided more superior reading achievement results than the basal method. The pattern of difference in reading achievement among children in

each of the three methodology groups continued similarly through the close of second grade (Hahn, 1967).

Mazurkiewicz's (1966) study revolved around the language experience method. He combined the language experience method with the artificial orthography and language experience method with the basal method (traditional orthography). The results indicated no significant differences in reading achievement between the groups using either of the two combined methods as evidenced by tests given at the end of the first and second grades (Mazurkiewicz, 1967).

Comparing the diacritical marking system method, the artificial orthography method, and basal methods of instruction formed the core of Fry's study (1966). At the end of one year of instruction, he found no statistical difference in reading achievement based on the methods used. Children with differing degrees of reading readiness did equally well regardless of the methods. These results held constant at the end of the second year (Fry, 1967).

Tanyzer and Alpert (1966) compared the artificial orthography method to the phonetic method and the basal method. There was no statistical significance between the artifical orthography method and the phonetic method in reading achievement. Both of these methods, however, were superior to the basal method. Of the three methods, none was better suited to children with different degrees of readiness. The instructional materials used in the basal method were The New Basic Readers (1960-62). The instructional materials used in artificial orthography method were Early to Read ITA Program (1964). The instructional materials used in the phonetic method were Basic Reading (1963).

Another study using the artificial orthography method was investigated by Hayes (1966). He compared the artificial orthography method with three other methods: basal (whole word), phonetic, and basal plus phonetic. The children were divided into three groups based on IQ levels with the following results: 1) the top third, the high IQ group, did better using the artificial orthography

and phonetic methods; 2) the average or middle IQ range also showed higher achievement using the artificial orthography and phonetic methods; and 3) the lowest third in the IQ range did best using the artificial orthography method.

Generally speaking, therefore, by the end of the first grade, the artificial orthography, the phonetic, and the phonetic plus basal appeared to help children reach higher reading achievement. By the end of second grade, however, there was no statistical difference among the four reading instructional methods in reading achievement for all of the children. Again, while there was no statistical difference, the children in the low IQ group averaged one-third of a grade level higher using the basal method compared to each of the other three methods and the children in the high IQ group achieved higher results using the phonetic and artificial orthography compared to the basal method. There was no reported difference for the middle IQ group (Hayes & West, 1967). The instructional materials used in the artificial orthography method were Early to Read ITA Program (1964). The instructional materials used in the phonetic method were Phonics and Word Power (1964) and Basic Reading (1963).

The linguistic method was compared to the basal method in a study done by Schneyer (1966). The basal method produced superior reading achievement for all of the children. In a treatment by levels there was found to be significant interaction only between the basal method and the high IQ reading group. Results at the end of second grade held constant for reading achievement in general, but this time significant interaction occurred between the basal method and the average ability group (Schneyer, 1967). There was no significant interaction at the low or high ability levels. Thus, the results did not provide consistent interaction based on ability levels and methods implemented.

The linguistic study done by Sheldon (1966) also included a comparison of the basal method and a "modified" linguistic method. There was no significant differences in reading achievement even when comparisons were made across

readiness levels. All three of the instructional reading methods continued to be effective in terms of reading achievement at the end of second grade (Sheldon, Nichols & Lashinger, 1967).

Ruddell (1966) did a comparative study using a linguistic method, a linguistic plus language experience method, a basal method, and a basal plus language experience method. When the linguistic and basal methods alone were compared with linguistic and basal methods supplemented with language experience, the latter methods produced higher reading achievement. Next, the methods were singled out: basal plus language experience versus basal alone and linguistic plus language experience versus linguistic alone. When the linguistic method was compared only to the linguistic plus language experience, the latter method produced superior readers. Unexpected results occurred when the basal method was compared to the basal plus language experience; the basal method alone produced superior reading results. No explanation was reported. At the end of the second grade a comparison between the basal and linguistic methods alone revealed no significant difference (Ruddell, 1967). The other results held constant.

Stauffer compared the language experience method (language arts) to the basal method (basic reader). The population using the language experience method earned significantly higher scores in reading achievement than did those using the basal method. The results remained constant at the end of second grade (Stauffer, 1966). Vilscek and Cleland (1966) also compared the language experience method (integrated experience approach to communication) to the basal method (coordinated basal language arts approach). The language experience method produced superior reading achievement except for those boys in the lower socioeconomic level who performed better using the basal method.

Another study using the language experience method was done by Kendrick (1967). He compared it to the basal method (traditional method). Contrary to the results of Vilscek and Cleland (1966) and Stauffer (1966), Kendrick found that the basal

method was more effective in reading achievement for males of all socioeconomic levels and for middle-class females. At the end of the second grade, the basal method proved most effective only for boys and girls of high socioeconomic level (Kendrick & Bennett, 1967). Thus, both sex and socioeconomic status played some role in the interaction between methods and achievements. No other significant interactions were reported.

An interpretation of the results of the Cooperative Research Program seems to indicate the following:

1) Word attack skills should be taught regardless of the method used. It should be done systematically and sequentially.

2) Eclectic reading methods, such as a basal plus a code-emphasis method, are superior to any single method.

3) Including a language experience component to a code-emphasis reading method is beneficial to general reading achievement.

4) The linguistic method supplemented with a basal approach is promising for a defined population.

5) Reading achievement may be related to instructional methods and other characteristics not discussed in this study such as personality variables.

6) No one instructional reading method is distinctly better in all situations to be considered the one "best" method.

7) Comparisons of projects has limited value because of project differences.

8) Assessing the successful elements of each reading method and incorporating them into an instructional program may be a more effective approach to teaching than singling out any one specific method to the exclusion of all others.

9) Improved methods are needed to measure not only aptitutde, but also to measure the interaction between differential methods and aptitudes.

Summary and Conclusions

There are certain conclusions which surface from a literature survey on reading research using normal learners.

First and foremost is the fact that reading is a complicated process and, as a result, more sophisticated and precise analysis of the reading process is urgently needed.

Second, while the Cooperative Research Program took a step in the right direction, there is still a further need for clarification of methodology and materials and a unity in statistical procedures.

Third, in the rare instances where interactions between aptitude and alternative instructional methods were reported, no attempt was made to interpret these findings.

Finally, the studies reviewed indicated a correlation between programs using early code-emphasis and superior reading achievement. Adding a language experience component seems beneficial.

TEACHING LD CHILDREN TO READ

OVERVIEW

The first and most discouraging finding is that there is a scarcity of research on teaching reading skills to LD youngsters, Orlando (1973) comments in his article:

> Research on teaching learning disabled children how to read is negligible. It seems incredible after 12 to 15 years of increasing emphasis on learning disabilities that nothing is available to assist special educators in educational programming for these children (p. 269).

This conclusion is echoed by Perlman and Perlman (1970), Hammill and Bartel (1971), Richardson, Winskey, and Bealey (1973), Kline and Kline (1974), Wiederholt (1974), Chall (1978), and Guiltue, Seifert and Kline (1978).

What little research exists suffers from a number of limitations. A major shortcoming is the tendency to compare whole methods without looking critically at their component parts. Thus, the "phonics" method should be compared with the "language experience" approach without consideration of what elements, if any, are crucial variables across methods for handicapped learners. Secondly, much of the LD research consists of clinical success stories, wherein a practitioner discusses remediation procedures which have been successful with a particular group of children.

But, as these studies frequently contain few subjects and inadequate controls, findings cannot be generalized. Often a clinician compares original materials to established programs. Without complete descriptions of these new methods, such studies are impossible to replicate. Finally, researchers in the LD field have spent the last two decades working in areas that have proved to be blind alleys (i.e. perceptual training, modality preference approaches, multisensory techniques, etc.). Thus, despite the great need for LD reading research, what studies have been conducted are not, for the most part, adequate or useful.

STUDIES COMPARING INSTRUCTIONAL METHODS

The greatest percentage of studies on instructional methods for LD children seems to pit one method against another in order to find the best technique for all disabled readers (as was the case for the normal population). Investigations vary on amount of instructional time, criteria for subject selection, definitions of reading method and measurement instruments. Therefore it is not surprising that findings are contradictory and inconclusive. Below is a representative sample of method vs. method studies.

Phonics vs. Other Popular Methods

Summerell and Brannigan (1977) compared artificial orthography with the phonetic method. Instructional materials were Johny Right-to-Read and Distar. The subjects were beginning second graders (12 girls and 12 boys) of average

intelligence (no test given) who had low scores on the Stanford Achievement Test. At the end of second grade, post-testing (Stanford Achievement Test) revealed significant differences in reading achievement in favor of the children using the phonetic method.

Server, Shapiro and Shapiro (1973) compared a phonetic method (direct remediation technique) to an indirect method using perceptual training (no reading remediation), a combined method (phonetic method plus perceptual-motor training), and a control group (who took walks and listened to music). Instructional materials were Distar (1969) and techniques recommended by Kephart (1964). The 62 subjects were "high risk" beginning first graders. The primary consideration for determining a subject as "high risk" was based upon differences between potential and achievement. The screening tests used were the Metropolitan Reading Test, Letter Names Test, Goodenough-Harris Drawing Test, and Primary Mental Abilities Test for Grades K-1. At the end of first grade, using the Gates-McKillop Oral Reading Test, no significant differences were seen among the four groups. The investigators suggest that a more intensive treatment was needed for these children.

Kline and Kline (1974), in a four year follow up study, compared the phonetic method (structured alphabetic-phonics, multisensory system) to a "smorgasbord method" or "no special help." The phonetic method was based on the Orton-Gillingham approach used in conjunction with Basic Reading (1969). Using a Psychoeducational Test Battery, the subjects were diagnosed as dyslexic. The degree of retardation in reading was not given. Although standardized test results in reading were not presented, the investigators reported that of the 92 subjects in the phonetic group, only 4.3% showed no improvement whereas 50.2% of the "smorgasbord-no special help" group was unimproved. A further finding indicated that length of treatment was an important factor in obtaining good results. Most cases required two years of remediation and some required three or more years

of help.

Silberberg, Iversen and Goins (1973) compared the basal method (visual emphasis approach) to a language experience method (kinesthetic) and to two different phonetic methods (synthetic-auditory phonic approach and systematic phonic approach). Instructional materials were not given - basal, techniques recommended by Fernand, 1943-LE, Lippincott Readers (1963) - phonetic auditory and materials based on the Orton-Gillingham approach - phonetic systematic. The 102 subjects were entering grade 3, with an IQ of 90 or above (Lurge-Thorndike Intelligence Test) and were retarded one year in reading based upon teacher evaluation. At the end of third grade, post-test results (WRAI and Gilmore Reading Test) revealed that the greatest gains were made by the phonetic group using the Lippincott Readers. Tests conducted six months after remediation indicated that the improvement in reading was transitory--regardless of the method used. These results do not necessarily negate the effectiveness of the phonetic method, but rather may point out the need for further remedial instruction.

Phonics vs. Phonics (Experimental Materials)

Richardson, Winsberg and Bialer (1973), in a limited study, investigated the differences in achievement results between a phonetic method using commercial instructional materials and phonetic method using instructional materials developed by the investigators. Instructional materials were Sullivan Reading Program (1967) - phonetic, and investigator made. The 18 male subjects, in a state hospital school, were severely retarded in reading by 2 to 6 years (no test given). After a total of six hours of instruction, using the Sullivan Placement Test as a post-test, both sets of instructional materials were found effective. On a test constructed by the investigators, the group using the investigator-made materials performed better. This superior performance was noted in the group's ability to make skill generalizations that transferred to decoding new unknown

words.

Language Experience Approach vs. Other Popular Methods

Willson (1968) compared the effectiveness of the language experience approach to a linguistic and a basal method. Seventeen male subjects who were reported to be retarded in reading, were exposed to a designated method for one and a half hours over six sessions. The author found that children with a "functional" etiology had better achievement with a linguistic method, while children with an "organic" etiology performed better using the language experience approach. However, supporting neurological data to substantiate organicity was not included. In addition, the study was affected adversely by a small sample and a short period of instruction.

THE RELATIVE EFFECTIVENESS OF MULTISENSORY TECHNIQUES

For many years, multisensory procedures have been among the most widely recommended and used strategies for remedial reading intervention with severely impaired learners. More recently, VAKT (visual auditory kinesthetic tactile) techniques have also been used with children who are experiencing milder problems in reading decoding (Haring & Bateman, 1977).

Historical Background

Fernald (1921) is generally credited with originating both VAKT and VAK (visual, auditory, kinesthetic), the latter a modified kinesthetic approach which can be used as an initial procedure with less severely disabled readers. In the total VAKT approach, the child is asked to trace over letters or words being presented on a card, and say the whole word, repeating this process until he can write the word from memory. Fernald's other contributions, having children write their own stories, has evolved into the language experiences approach. However, this strategy is not invariably used in conjunction with her VAKT and VAK methods.

Orton (1937), a neurologist is considered by many to be the father of the

visual deficit theory of reading failure. He believed that the basis of childhood dyslexia was faulty cerebral dominance which reveals itself in reverse and sequence errors. The remedial systems of Kirk (1940), Gillingham and Stillman (1946), Slingerland (1971), Cox (1967), Childs and Childs (1963), and Spalding (1957) are among those based upon Orton's theories and recommendations. Remedial technique, as developed by him and his followers, has been summarized by Mrs. Orton (1966): "the common conceptual background can usually be seen in their introduction of the kinesthetic elements to reinforce the V/A language associations and to establish left-to-right habits or progression" (p. 144).

There was some divergence among the early writers as to specifics of method. For instance, Orton stated that the child should trace, say the individual phonic sounds and then the whole word. Gilliham believed that saying the letter names while tracing or writing, and then the whole word, was the most effective means of teaching for word retention. Fernald specifically cautioned against breaking up a word artificially, via sounding out or letter naming, and had her pupils say the whole word while tracing or writing. However, all were united in condeming a simple visual-auditory emphasis as being inadequate for teaching word recognition skills to disabled readers - and all promulgated multi-sensory techniques.

Theoretical Foundations for use of VAKT Techniques

Although the use of VAKT procedures grew out of clinical observations and practice, early practitioners developed various theoretical rationales. Included among these are the belief that multisensory techniques aid: in learning words with irregular grapheme/phoneme correspondence (Gillingham, 1946); in discriminating readily confused letters, such as b and d (Monroe, 1932; Orton, 1937); because they pair weak modality (often considered to be visual perception by these theorists) with a supposedly strong one (haptic), creating new connections in the brain (Frostig, 1972). Also suggested is that VAKT techniques help in left to right progression (Orton et al.); in permitting poor readers

(who were often thought to be haptic learners) to relate through their strong modality (Lowenfeld, 1945; Fernald, 1937); because the image is more quickly fixed through the cooperation of the senses (Montessori, 1912). VAKT is also believed to be important in forming "schema" or image that would become the foundation of correct discrimination and because motor imagery of movements involved in writing and tracing reinforces the auditory-visual associations between the sound of the word and its printed form (Fernald, 1943). Monroe (1932) states that by forcing the child to make different motor responses to different sensory characteristics, and thereby reinforcing the visual and auditory stimuli with discriminable kinesthetic cues, we may ultimately develop more precise discrimination of auditory characteristics. Multi-sensory procedures are also considered to help in focusing attention upon details of a word, as LD children tend to process words rather superficially (Gates, 1927); in providing for more reliable incoming data (Harris, 1976); in retrieving word from long-term memory (Slingerland, 1971); in permitting child to select whatever cues are the most helpful to him in learning (Harris, 1976). Neurological theories were also used as buttresses for rationales, notably those of Hebb (1947) and Luria (1960).

Blau (1968) and Johnson and Myklebust (1967) cautioned against VAKT approach for all LD youngsters. They suggested that some children may even need unisensory input, as they have difficulty in processing information through two channels, let alone 4. Blau developed a technique which initially circumvents the visual modality: the teacher blindfolds the child and then writes the word on child's back while it is being spelled aloud by teacher. Then, still without vision, the child arranges 3-dimensional letters in appropriate sequence (AKT technique).

All of these procedures have reportedly had good readers results with clinical cases. However, controlled experimental studies with retarded readers

have been sparse, and little research has touched upon the relationship of haptic processes and reading (Silverberg, 1974).

Challenges to VAKT Theories

The perceptual deficit and faulty cerebral dominance theories have been supported by many workers in the field (Zangwill, 1962; Silver & Hagen, 1966; Bender, 1957; Frostig, 1972; Critchley, 1977) and challenged by others (Schonell, 1948; Burt, 1950; Vernon, 1960; Vellutino, 1977; Lieberman et al., 1971). Lieberman, in a study of word reading of second graders found no correlation between reversal and sequencing errors, suggesting that they do not have common cause. (Lyle, 1968, had found similar lack of correlation.) Lieberman also suggested that the slight preponderance of vertical plane transformations (e.g., b to p) do not lend support to the view that letter reversals are attributable to reversed direction of scan (as in right to left progression in reading). In addition, errors of rotation were specific to word reading and seldom made at individual letter level, even in brief tachistoscopic presentations. The authors reasoned that they cannot therefore be regarded simply problems in form perception.

Vellutino (Vellutino et al., 1977) states that recent research findings strongly support the position that corrective measures issuing from visual deficit explanations of reading disability may have little utility. He suggests that apparent perceptual problems in poor readers are a secondary manifestation of verbal encoding difficulties. Earlier, Benton (1962) had noted methodological weaknesses and conflicting results in most of the studies of visual perception and visual motor deficits in relation to reading problems. He concluded that deficient form perception and impaired directional functioning are not significant correlates of reading disability. Allington, Gormley and Truex (1976) concluded from their study, which compared poor and normal readers on visual tasks involving high frequency-low discriminality words, that visual perception deficit is unlikely to be a major factor in reading disability. They suggested that poor readers

tend to have difficulties in verbal mediation and association, rather than visual perception, per se. Du Bois (1973) found no significant relationship between selected tests of visual perception, visual-motor and visual sensory integration skills and second and fourth graders, after controlling for the effects of performance on verbal-based tests of intellectual efficiency. Postel, G'stell, Krief, Postel (1972) found that blind children showed disorganized digital reading, reversals of movement and other anomalies seen in sighted children. They suggest that dyslexia can affect the reading and writing of linguistic signs whose material basis and perception have no link with the sphere of vision. Kershner (1975) found that conceptual, spatial abilities of 7 year olds were more highly related to reading achievement than their visual perceptual abilities. Hare (1977) found that measurable deficits in visual perception were not interfering with normal reading achievement among second grade population. She suggests that perceptual disabilities should not be used as indicators to predict reading problems. Bryant (1967) and Rossky's (1975) studies indicate that visual perception was not a problem in their studies of retarded readers.

Related to visual perception training is the remediation of other theoretical underpinnings to reading, such as motor-sensory and motor-visual integration. Balow (1971), after extensive literature searches, failed to find scientifically acceptable data which demonstrated specific effectiveness for any of the physical, motor or perceptual programs used in prevention or correction of reading or other LD. Hammill et al. (1974) found little evidence in past research to suggest that motor-visual training programs help reading or perceptual processes. Larsen and Hammill's (1975) review of research concludes that there is not a necessary relationship between reading and visual-motor integration, spatial relations, visual memory or visual discrimination as measured by current instruments. However, a few researchers (Ayers, 1972; Clark, 1972; Adams, 1978) report improvement in academic and/or perceptual and motor performance following

training.

In a study of neural organization, Witelson (1976) found that language functions of dyslexics were lateralized in the left hemisphere, although processed poorly. She also found that dyslexics may have bilateral spatial representation, with the left hemisphere involvement greater in dyslexics than normals. This suggests that the left hemisphere may be overloaded in some dyslexics, which has implications for VAKT theory. Witelson found that simple tactual linguistic stimuli, such as letters, were not processed more efficiently by the left hemisphere of the brain. This suggests that linguistic stimuli presented tactually must be analyzed first in a spatial code and then translated into a linguistic one. It is probable that there is no direct link between input and linguistic analysis in the tactual modality, as there appears to be in the visual-auditory ones. This finding also has implications for multi-sensory techniques.

RESEARCH RESULTS OF VAKT'S IMPACT ON WORD RECOGNITION AND VISUAL DISCRIMINATION

It is difficult to obtain meaningful data from the studies in the literature which compared the use of variations of multi-sensory techniques with other types of treatment (frequently auditory and visual presentations). The studies appear to have a number of limitations: many are in the form of clinical case reports with no control groups; in several the population is too small; in some instances there are no comparisons to other possible treatment approaches. In studies of groups using different approaches, teacher variables are difficult to control adequately (were teachers really following experimental program or did they insert a bit of phonics into the visual approach to help the learner? Did the child really utilize the technique presented?) Where there was much enthusiasm (and maybe newer materials and more recent teacher training) for VAKT methods, it was hard to control for the Hawthorne effect. In addition, researchers often use general reading achievement scores as measures of improvement, rather tahn measuring discrete skill being taught, thus possibly

obfuscating results.

The following research studies with widely varying subjects found no superiority when using VAKT techniques. Burt and Lewis (1946) using a small number of dull children found visual techniques superior to alphabetic, kinesthetic and phonic techniques in the learning of syllables. In studies with normal K youngsters, Christina (1971) and King (1970) found no superiority for the tracing technique over other methods in word learning. Miller's (1974) 4 year olds did not improve in visual recognition with the addition of haptic cues. Levin and Feldman (1964) did not find writing profitable as pretraining for reading with normal K population; multi-sensory teaching even caused confusion leading to negative transfer unless the most salient cues were used (initial letter). Williams (1969, 1975) found no superiority for tactile or kinesthetic copying methods in teaching K children to discriminate letter-like forms. In a study using older disabled readers comparing finger tracing, eye tracing, and a visual method, Ofman and Shavite (1963) found the first two conditions to be superior to the purely visual approach; the authors postulated an attentional factor as the reason for the superiority, rather than the haptic involvement. In comparing the use of typewriter vs. handwriting in learning by poor visual motor learners, Campbell (1976) found the typewriter facilitated acquisition of reading vocabulary skills more than handwriting. Koepsel (1974) compared Fernald's VAKT, Blau's AKT and eclectic techniques and found no difference among these approaches with 73 educationally handicapped junior high youngsters. However, subjective teacher comments suggested pupil's preferences and better behavior with the first two methods. Long (1974), using a multi-sensory vs. a traditional spelling program, found no improvement in reading achievement.

In a number of studies of aptitude and treatment interaction, S's were tested for modality strength and then taught via the strong or the weaker modalities. The modality studies usually compared the visual and auditory, but there

have been some haptic studies. Silverberg et al., (1973), Dauzat (1970), Vandever and Neville (1974), Ringler and Smith (1973), Wolpert (1970), Drader (1973), Smith and Ringler (1971), and Schlief (1969) found no significant differences among elementary school age children when reading skills were taught to the strong as compared to a weaker modality. Also, no significant superiority was found for the use of VAKT techniques over the other approaches. Vandever and Neville (1973) found that poor first grade decoders even did better with visual and auditory methods, as they became so involved with mechanics of tracing that they were not attending to words as stimulus.

A number of studies, again keeping methodological weaknesses in mind, suggested superiority for some learners, when using varying aspects of VAKT procedure. These included Robert and Coleman (1958), Kirk (1933) using 6 subjects, Pullian (1958) using only 5 retarded readers and 10 normals per group, Keller (1955) using no control group, Collings (1941) who did not control for sequence and may have had a transfer of training effect in his VAKT condition, Berres (1967) who used variations of additional motoric reinforcement with culturally deprived subjects, Roberts (1955) who may have confounded his visual condition by including a copying task, Elenbogen (1972) who had no control group, Schiffman (1966) who did not control for size of groups, teacher training materials and other variables, Mills (1966) whose four approaches may not be valid, as suggested by later research, Thom (1971) who also added VAKT to motor reinforcement, Enfield (1970) who used new material and trained teachers for the VAKT condition only.

Wolff et al. (1972) found that tactual manipulation was superior to paried associative learning. In a modality study, Abrams (1976), who taught 60 low SES kinesthetic preferring first grade S's via VAKT, auditory, kinesthetic methods, randomly assigned, found superiority for the tactile group over auditory. However, her tactile approach was more structured and efficient than the visual presentation.

A number of studies of haptic perception (Gisonti, 1971; Silver and Hagen, 1966; Adams, 1978) suggest that the haptic modality in LD children can be just as much of a deficit areas as the visual and/or auditory. It seems unwise to recommend use of multi-sensory teaching methods for youngsters who already are having difficulty with such tasks as tracing and handwriting. It seems likely that using additional deficit areas would make learning to spell or read even harder, as Vandever and Neville (1973) found in their study.

Experimental studies as to the efficacy of VAKT procedures in the teaching of reading have been inconclusive, due to procedural and other research limitations, which make it hard to draw meaningful conclusions. The weight of the evidence, at this time, rests with those researchers who found no superiority for the use of multi-sensory procedures over other approaches. However, a number of studies did find significantly improved reading performance in the VAKT condition. Until such time as more definitive work is done in the area of multi-sensory reading instruction, the controversy over the efficacy of these approaches will continue.

READING METHOD STUDIES WITH NO CONTROL GROUP

It is generally recognized that good research includes some type of control group. Unfortunately, much of the LD literature reflects the lack of sophisticated research methodology. In order to give a representative picture of the state of research, two studies which lack controls have been included.

Lane (1974) predicted that sixth grade students who had a Stanford Achievement Reading subtest score of 2.0 or below would make reading gains using an artificial orthography method. Instructional material was Early to Read ITA (1964). At the end of six months, using the Gray Oral Reading Test, an average improvement of one year was shown. The investigator interpreted that the "positive results provide evidence that the ITA is a tool which can help severe disabled readers in the United States" (p. 483). And yet, in the learning procedures, it was

pointed out that children were not taught in traditional stages, but rather were taught each step in reading only after mastery at each point was achieved. Perhaps the departure from traditional procedures contributed to the success in reading. The few subjects involved in this study and the lack of a control group severely limits inferences which can be drawn .

Haring and Hawch (1969) anticipated that the phonetic method, using a "systematic presentation of reinforcing events to optimize each child's performance" would be successful for children with severe reading disability. Instructional material was Sullivan Programmed Reading (1967). Four elementary school boys, with an "average" IQ (no test given), retarded in oral reading from 1 to 5 years (Gates-McKillop Oral Reading Test), were given daily instruction for three months. Using an informal leveling test as a post-test measure, substantial gains were reported. Again, lack of a control group, and the small number of subjects involved in the study negates an attempt to generalize.

SUPPLEMENTAL INSTRUCTION STUDIES

There are a number of investigations regarding the efficacy of various types of supplemental instruction for the learning disabled child. These range from studies of peer teaching to evaluations of clinical intervention. Generally, regardless of the type of assistance, results are positive. Since all supplemental instruction gives children additional time and practice with basic skills in a one-to-one or small group framework, it is not surprising that LD youngsters make significant gains. This section is divided according to type of service provided to the youngsters.

Resource Room Investigations

Weiner (1961) investigated the effectiveness of resource rooms for children with learning disabilities. The 72 subjects whose ages ranged from 7 to 12 years, had an IQ range from 90 to 130 (WISC). Each child was at least one year retarded in reading. Treatment involved a highly individualized tutored program using

"a wide variety of teaching approaches, methods and materials." Pre-post test scores (WRAT) at the end of one year indicated statistically signifant differences in reading performance. Weiner sees the resource room as a viable alternative to a self-contained class for children with specific learning disabilities.

Wadsworth (1971) tested the effects of clinic tutoring, a self-contained learning disability class and a resource room on the reading achievement of ten boys identified as having "severe reading problems" (degree of retardation not given). Post-test (Slossen Oral Reading and WRAT) results indicated significant gains in reading achievement for all the conditions except clinic tutoring. The fact that each boy was given all three treatments in the same order limits any clinical interpretation. In addition, there were no controls and the number of subjects in the study would tend to diminish the findings.

Tutoring Studies

Shaver and Nuhn (1971), in their study, questioned the effectiveness of tutoring students "achieving below potential" in reading. The California Test of Mental Maturity and the Sequential Test of Educational Progress were used to determine the eligible students. One hundred-forty-six students from grades 4, 7 and 10 were tutored in reading daily for an entire year. A control group of 60 students, similarly retarded in reading (20 from each grade level) remained in the classroom. The tutors were either experienced teachers or people who earned a college degree or people who had not earned a college degree but scored high on a criteria test used. The materials and methods used were not described. At the end of the year, using the STEP test, significant differences were reported in favor of the group that had been tutored. The greatest gains in reading were made for the seventh and tenth grade levels. Tests conducted two years after remediation indicated that the gains made were sustained at the seventh and tenth grade level, but not at the fourth grade level. No attempt was made to discuss or interpret these latter results.

Stephens, Hartman and Cooper (1973) also compared the effectiveness of tutoring disabled readers. In this study subjects from grade one and two were selected based upon teacher recommendation or scores on the California Achievement Test indicating reading retardation of one half year or more. All children had an IQ of 90 or higher (California Test of Mental Maturity). Fourth grade children were tutored in reading daily for one year. A control group of 26 children similarly retarded in reading remained in the classroom. A third group who were achieving in reading was also compared. The tutors were all at different stages in their professional training, from an experienced teacher to an undergraduate in college. They were "provided with specific procedures and materials to be used with their students." Significant differences in reading achievement using the CAT were reported in favor of the tutored group. The children in the tutored group made gains comparable to the children who had been achieving in reading. The investigator attributed the positive results to the technology used by the tutors. This would seem to include two learning procedures used. The first procedure was not moving to a new task until "masters: accuracy above 90 percent" was achieved. The second procedure was meeting "each child for two daily 10-minute sessions." Why this technology seemed effective was not discussed.

Willis, Morris and Crowder (1972) questioned if students in grade eight could be effective tutors with students disabled in reading in grade four. Ten fourth grade students with an IQ range of 71 to 91 (Slosson Intelligence Test) and an oral reading range of 1.3 to 3.2 (Slosson Oral Reading) were tutored for 75 days. Reading test results (Slosson Oral Reading) indicated that "the program was very effective." A mean reading gain of 1.2 years was achieved. The small number of subjects in the study, as well as the lack of a control group, limits any attampt to generalize findings.

Clinic Studies

The effectiveness of a remedial reading clinic for elementary school children

retarded in reading by at least one year (test not given) was investigated by Perlman and Pearlman (1970). Children in grades 1 through 6 attended a reading clinic two times a week after school, for differing amounts of time (from 4 months to 19 months). Significant gains in reading achievement were reported (test not given). A two year follow-up study indicated that those children who had been discharged at a point of "independence" in reading sustained their reading gains and continued to achieve. This point may help to explain why the children in Silverberg's (1973) and Shaver's (1971) study did not sustain their gain. That is, remediation may have been terminated prematurely.

Hecherl and Webb (1969) also investigated the effectiveness of a reading clinic. Two hundred-forty children were provided with remedial programs at the Learning Improvement Center using an interdisciplinary approach. The subjects were second, third and fourth graders, with a mean IQ of 90 (Lurge-Thorndike Intelligence Test), considered retarded in reading (degree of retardation not given). Pre-post test evaluation in oral reading (Gates-McKillop Oral Reading Test) at the end of one year were statistically significant at the .01 level. Interpretation of the results is difficult because it is not clear how the children were placed in the various remedial programs nor exactly what these programs were. In addition, the study lacked a control group.

SUMMARY AND CONCLUSIONS

From the research, it appears that there is no standard definition of what constitutes a reading disabled child or any specific procedures for identification. In addition, the question of what techniques are effective with an LD population is left unanswered.

The perceptual deficit theory, which has provided the base for multi-sensory and other remedial approaches, is currently being challenged. Recent findings suggest that reading proficiency is more affected by cognitive/linguistic functioning than by perceptual factors. Further research in the former is necessary

before new remediation plans can be devised.

Clearly, research emphasis needs to be placed on specific elements that foster achievement regardless of method. Method research with LD children, as with normal learners, has not proved fruitful. Well-designed control studies with clearly defined populations would serve to enhance the utility of the data base in the field.

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